

## *Bahadzia patilarga*, a new species of subterranean amphipod crustacean (Hadziidae) from Cuba

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*Abstract.*—A new species of *Bahadzia* is described from an anchialine cave on the southern coast of Cuba. *Bahadzia patilarga* is the second species of the genus to be described from Cuba. Both Cuban species have eye spots and are found with remipeds and thermosbaenaceans at or near the halocline.

Since the initial description of the genus *Bahadzia* by Holsinger (in Holsinger & Yager 1985) on the basis of two stygobitic species from anchialine caves in the Bahamas and Turks and Caicos, seven more species have been described. These species are found in the Bahamas, Turks and Caicos, Cuba, Hispaniola and on the Yucatan Peninsula. To date, the only species of *Bahadzia* described from Cuba is *B. yagerae* (Ortiz & Pérez 1995). The present paper describes a second species of *Bahadzia* from the southern coast of Cuba. Although both this new species and *B. yagerae* exist in caves approximately 17 km apart, and both have eye spots, they are otherwise morphologically distinct. The following description raises the number of species in the genus to ten.

### Systematics

Family Hadziidae Karaman, 1943

Genus *Bahadzia* Holsinger, 1985 (in  
Holsinger & Yager, 1985)

***Bahadzia patilarga*, n. sp.**

(Figs. 1–4)

*Material examined.*—CUBA. Metanzas Province: Cueva de los Carboneros, Playa

Girón, holotype ♀ (4 mm), A. Pérez, 11 June 1998; 2 paratypes (♀ and juvenile), J. Yager, 14 September, 1992, and 2 paratypes (♂ and ♀), J. Bozanic, 15 September 1992.

The holotype is deposited in the crustacean collection of the Center of Marine Research, University of Havana, Cuba (No. 178). The paratypes are in the collection of John R. Holsinger (H-3242, H-3249).

*Diagnosis.*—Small to medium sized stygobitic species easily distinguished from other members of the genus except *Bahadzia yagerae* Ortiz and Pérez 1995 by having a tiny, round, pigmentless eye, but differing from *B. yagerae* by having proportionately longer pereopods 6 and 7. Further distinguished from all other species within the genus by possessing a much shorter row of setae on the extreme inner margin of the inner plate of maxilla 2 and fewer setae on anterior margin of the propod of gnathopod 2 of the female. Largest male 6.0 mm; largest female 6.5 mm.

*Female.*—Head with tiny round, pigmentless eye or eye spot. Antenna 1 approximately 40% longer than body and 2.25 times longer than antenna 2; primary flagellum with up to 39 segments, accessory flagellum 3-segmented, subequal in length

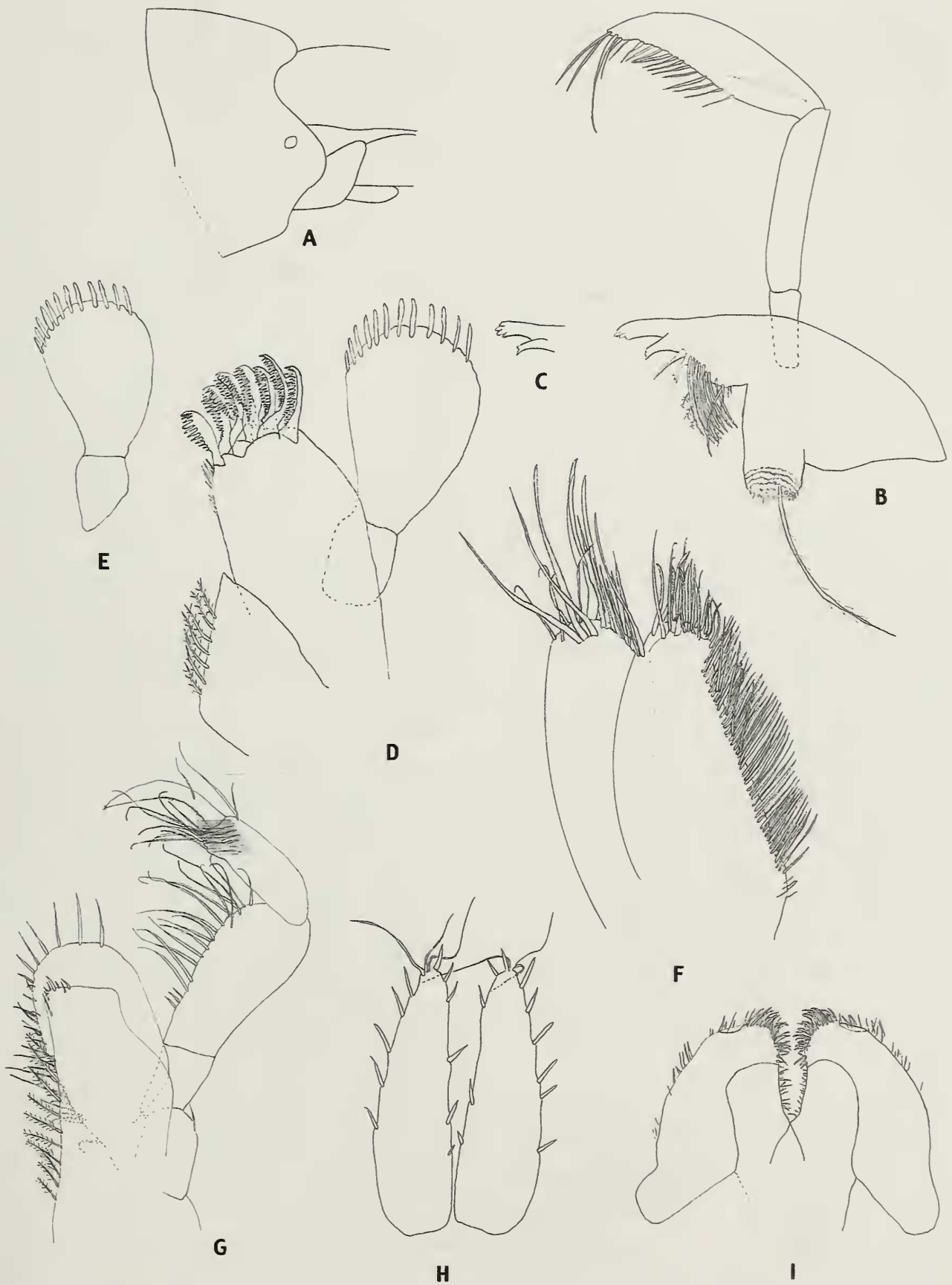


Fig. 1. *Bahadzia patilarga*, n. sp., paratypes from Cueva de los Carboneros, Playa Giron, Cuba. Juvenile (2.5 mm): A, head region with eyespot. Female (6.5 mm): B, left mandible; C, incisor and lacinia mobilis of right mandible; F, maxilla 2; G, maxilliped. Male (6.0 mm): D, maxilla 1; E, palp of other maxilla; H, telson; I, lower lip.

to the first 3 primary flagellar segments; peduncular segments becoming progressively shorter distally. Antenna 2: flagellum with up to 14 segments; peduncular segment 4 approximately 15% longer than segment 5. Mandible: molar well developed; spine row with 2 modified tooth-like spines distally and about 10 weakly serrate spines; lacinia mobilis of left mandible 4 dentate, that of right 3 dentate and smaller; incisor of left mandible 5 dentate, that of right 4 dentate and narrower; palp segment 3 as long as combined lengths of 1 and 2, bearing 1 long A seta, long row of approximately 13 D setae and 3–4 apical E setae. Lower lip: inner lobes distinct; lateral processes short, rounded apically. Maxilla 1: inner plate with 15 short, lightly plumose setae; outer plate bearing 9 pectinate spines; left and right palps similar, expanded and rounded distally, broad apex with 11 bladespines and single short, naked setae. Maxilla 2: inner plate narrowing distally, with row of approximately 45 naked submarginal facial setae and row of approximately 5 thicker setae located distally on extreme inner margin. Maxilliped: apex of inner plate even, armed on inner half with 4–5 short spines and a few short setae, inner margin with row of 10 weakly plumose setae; outer plate broader than inner with row of naked setae on inner margin and distally; palp segment 3 pubescent distally, distal inner margin of segment 3 slightly lobate; palp segment 4 almost as long as segment 3, nail small and spine-like.

Gnathopod 1: propod subrectangular about twice as long as broad, posterior margin heavily setose distally, palm short, transverse but lobate at defining angle and bearing 3 spines on lobe; carpus approximately 2 times as long as propod, bearing several clusters of long setae toward distal end; merus weakly lobiform and pubescent; basis with 7 long setae on posterior margin; coxa long and deep with about 9 short setae and 3 short spines. Gnathopod 2: propod subrectangular, palm short, oblique bearing short setae and 3 long setae at defining an-

gle, posterior margin with 4 sets of long setae, anterior margin with a few setae, not in clusters; carpus approximately 28% longer than propod, posterior margin with 9 clusters of long setae; basis with 5 long setae; coxa deeper than broad, margin with about 6 setae and 4 short spines. Pereopod 3: coxa relatively small, deeper than broad, margin with 3 short setae. Pereopod 4: coxa broadly expanded distally and excavate posteriorly, margin with 13 short setae. Pereopod 6 approximately 5% longer than body, approximately 7% longer than pereopod 7 and 90% longer than pereopod 5. Pereopods 5–7: basis relatively narrow, with rather large, bluntly rounded distoposterior lobes. Dactyl of pereopod 5 approximately 50% length of corresponding propod; dactyls of pereopods 6 and 7 respectively, approximately 30% and 13% of corresponding propods. Coxal gills on 2–6 subovate, with short peduncle, very large on pereopods 2–4. Brood plates sublinear, small relative to gills.

Pleonal plates: posterior margins with 1 setule each, posterior corners small but distinct; ventral margin of plate 1 without spines, plates 2 and 3 with 1 spine. Pleopods normal, coupling spines rather long. Uropod 1: inner ramus shorter than peduncle, longer than outer ramus, bearing about 5 spines; peduncle with 12 spines, 1 of which is basofacial in position. Uropod 2: inner ramus approximately 15% longer than peduncle, longer and broader than outer ramus, armed with 13 spines; outer ramus with about 6 spines; peduncle with 9 spines 4 of which form a comb row on dorsodistal end. Uropod 3 approximately 23% length of body; inner ramus slightly longer and broader than outer ramus, margins with short spines and plumose setae; outer ramus with short terminal segment, inner margin with plumose setae and a few spines, outer margin with spines only; peduncle without spines. Telson rather long and narrow, in two separate lobes; lateral margins with about 5 spines each, none in sets of two; medial margins with 3–4 small spines each;



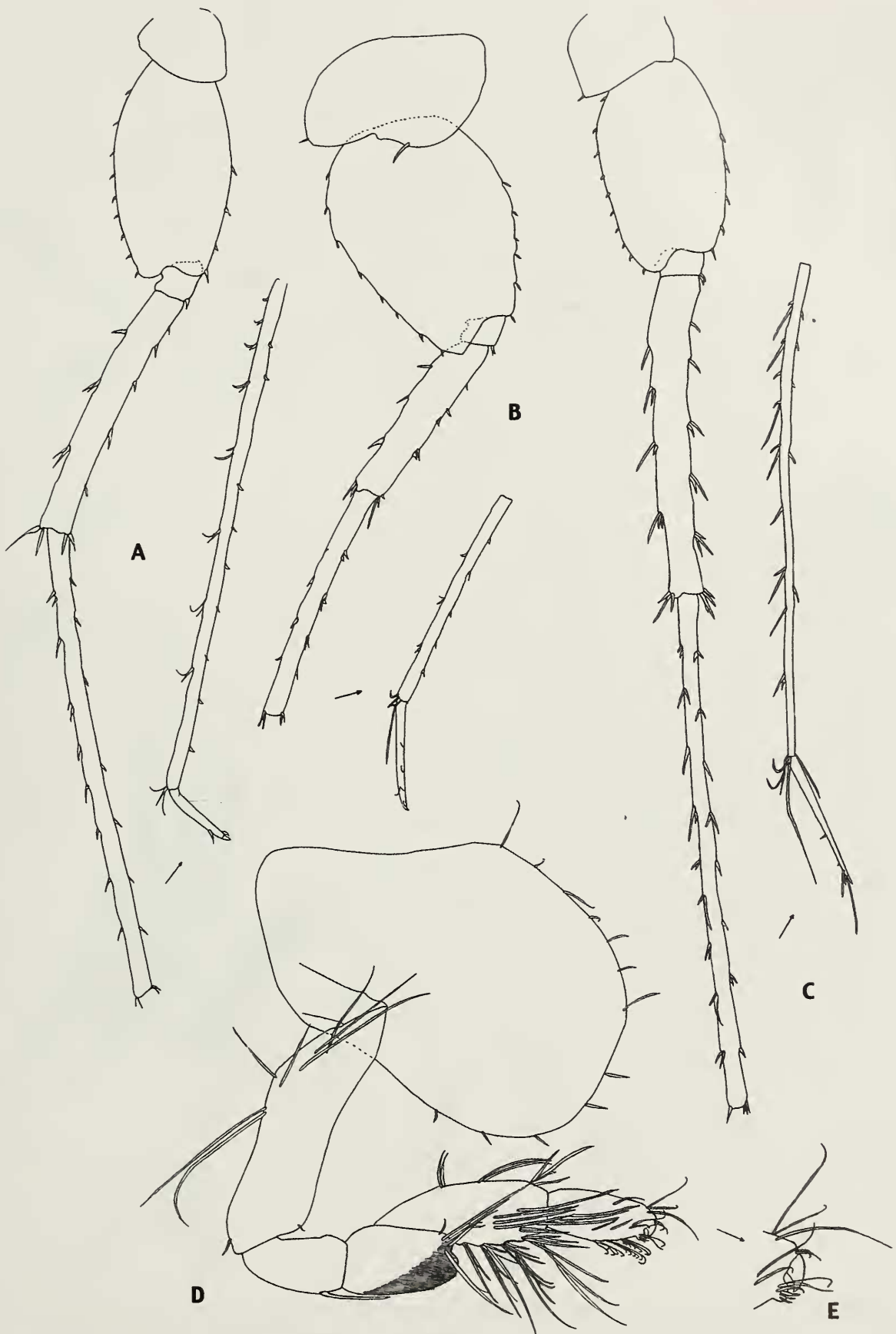


Fig. 2. *Bahadzia patilarga*, n. sp., paratypes from Cueva de los Carboneros, Playa Giron, Cuba. Male (6.0 mm): A, B, C, pereopods 7, 5, 6. Female (6.5 mm): D, gnathopod 1; E, enlarged distal end of propod and dactyl of gnathopod 1.

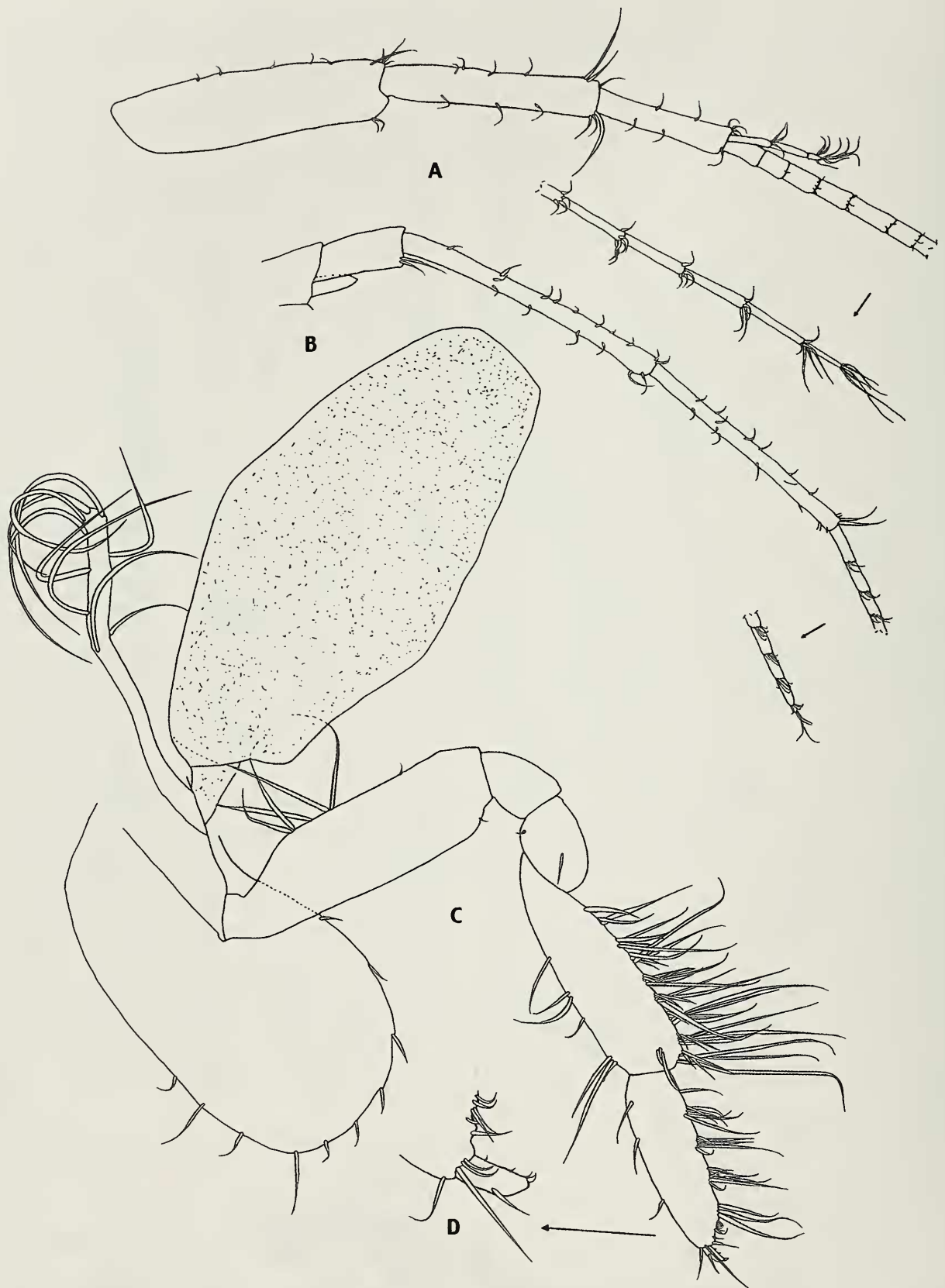


Fig. 3. *Bahadzia patilarga*, n. sp., paratype from Cueva de los Carboneros, Playa Giron, Cuba. Female (6.5 mm): A, B antennae 1,2; C gnathopod 2; D, enlarged distal end of propod and dactyl of gnathopod 2.

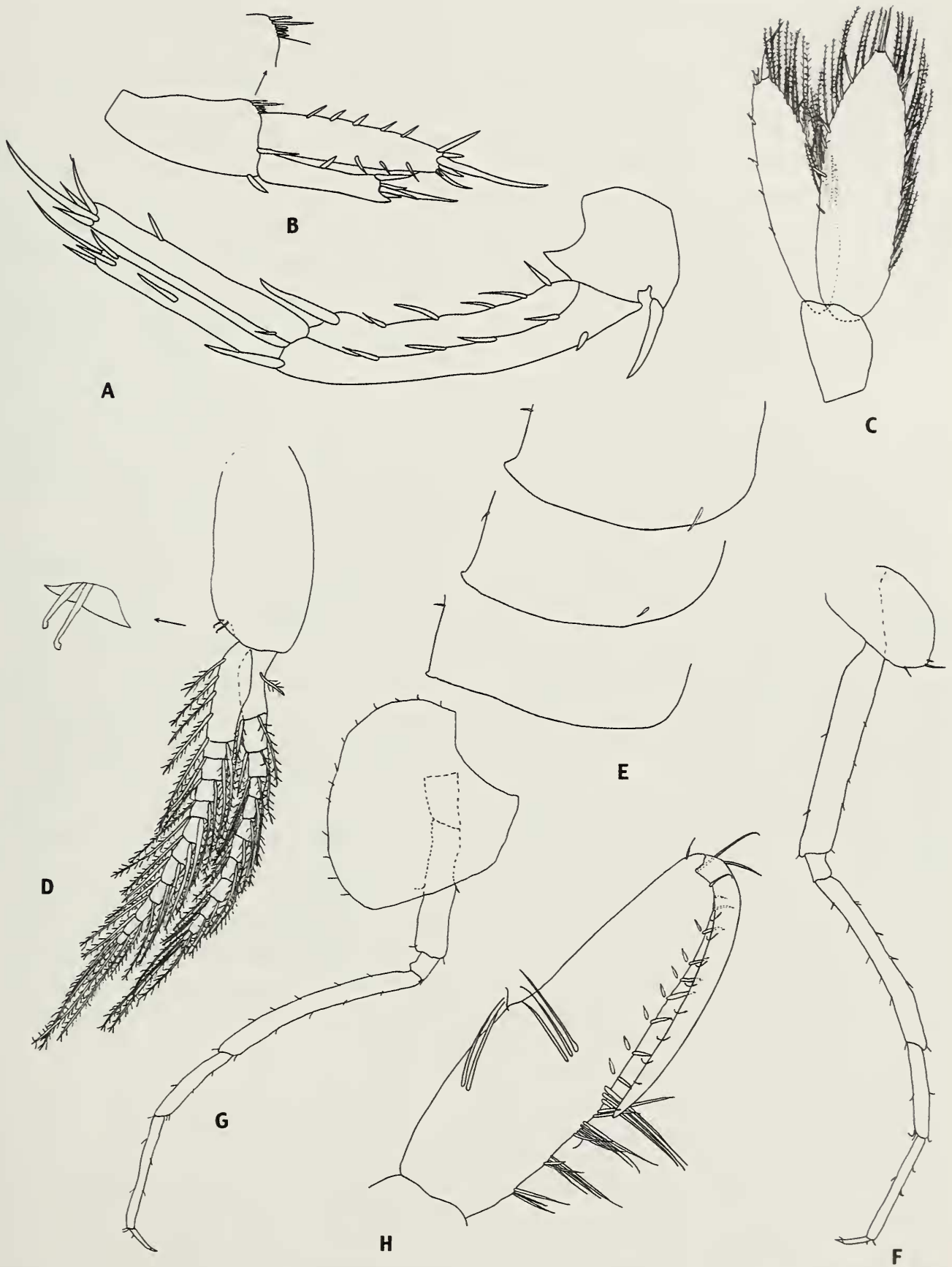


Fig. 4. *Bahadzia patilarga*, n. sp., paratypes from Cueva de los Carboneros, Playa Giron, Cuba. Female (6.5 mm): A, uropod 1; B, uropod 2 (distomedial spine row enlarged); C, uropod 3; D, pleopod 1 (coupling spines enlarged); E, pleonal plates. Male (6.0 mm): F, G, pereopods 3, 4; H, propod and dactyl of gnathopod 2.

apices with 1–2 short spines and 3 long, distally plumose setae.

*Male*.—Differing from female as follows: maxilla 1 inner plate with 7 short, weakly plumose setae; palp of maxilla 1 with 12 bladespines and without short naked setae. Gnathopod 2: dactyl and propod proportionately longer; propod palm long, oblique with double row of about 9 blunt tipped spines; defining angle with 3 long setae; posterior margin longer than palm, with 4 sets of setae. Distal margin of peduncle of uropod 3 with 2 spines.

*Etymology*.—The word “patilarga” is Spanish vernacular commonly used in Latin American countries to describe legs that are larger than normal. It is used here as a noun in apposition alluding to the extremely long pereopods 6 and 7 of the species.

*Remarks*.—*Bahadzia patilarga* was informally referred to as “cubensis” in an article written for a general SCUBA diving magazine and was not intended to be a formal taxonomic publication. Therefore the name “cubensis” is unavailable and invalid and should not be considered a synonym or *nomen nudum*.

*Type-locality*.—This species is known only from the type-locality, Cueva de los Carboneros.

### Discussion

*Bahadzia patilarga* is recorded to date from a single anchialine cave, Cueva de los Carboneros, which is located in Playa Giron on the southern coast of Cuba in Matanzas Province. Playa Giron is commonly known in America as the Bay of Pigs. Collection of *B. patilarga* was made at or near the halocline, where it occurs sympatrically with remiped and thermosbaenacean crustaceans. This association with remipeds and thermosbaenaceans and its specific microhabitat defined as being near or within the halocline of anchialine caves is very common, although not ubiquitous, for this genus. Based on research in caves of the Yucatan Peninsula, Pohlman et al. (1997) not-

ed that these crustacean taxa might be utilizing a chemoautotrophic energy source existing near the halocline. They suggested that a similar phenomenon may occur in anchialine caves throughout the Caribbean and southern Atlantic, where organisms such as *Bahadzia* exist. Pohlman et al. (1997) noted a dramatic drop in oxygen concentration precisely at the halocline, where they surmised that chemoautotrophism was occurring. Although no field data are available for the oxygen concentration at the halocline in the type locality for *B. patilarga*, it is interesting to note that, as with many (but not all) species of *Bahadzia*, *B. patilarga* has extremely large gills. Enlarged gills may be an adaptation for living in low oxygen environments.

Based on a track synthesis, Holsinger (1989, 1992) predicted the occurrence of *Bahadzia* in Cuba. The description of *Bahadzia patilarga* above brings the number of species so far discovered on the island to two. Both species exist in single caves a mere 17 km apart. Recent explorations by one of us (TRS) resulted in the discovery of a remiped crustacean in a cave on the northern coast of Cuba, also in Matanzas Province. Based on this discovery and the fact that remipeds and *Bahadzia* are often found living sympatrically, it is predicted that additional populations of *Bahadzia*, quite possibly representing new species, will be found in caves on the northern coast of Cuba.

### Acknowledgments

We are grateful to Jeff Bozanic, Jill Yager and the Biokarst Association of Cuba for assistance with collecting specimens, and we thank Tamara Connolly for assistance with preparation of the figures. This study was supported in part by a PEET (Partnerships for Enhancing Expertise in Taxonomy) grant from the National Science Foundation to JRH (DEB-9521752).

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